REMARKS

The application has been reviewed in light of the Office Action mailed on October 19, 2007. Reconsideration of the application is requested for the following reasons. Should the Examiner disagree that the following remarks place the application in condition for allowance, Applicants request a personal interview at the Examiners' earliest convenience.

Initially, Applicants request that the "Final" status of the October 19, 2007 Office Action be withdrawn. A Final Office Action "should include a rebuttal of any arguments raised in the applicant's reply." MPEP § 706.07. As discussed below, the Office Action failed to address the arguments raised in Applicants' Amendment submitted on September 4, 2007 ("September 4 Amendment"). Moreover, a second Office Action cannot be made Final where "the examiner introduces a new ground of rejection" that is not necessitated by Applicants' amendment. As discussed below, the Office Action introduced a new ground of rejection not necessitated by Applicants' amendment. For these reasons, the "Final" status of the Office Action should be removed as being premature. MPEP §§ 706.07 (c), (d).

Claims 68, 69, 76-79 and 86 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Glukhovsky et al., U.S. Patent No. 6,607,301 ("Glukhovsky") in view of Sakaue, U.S. Patent No. 4,162,411 ("Sakaue").

1. On page 13 of the September 4 Amendment, Applicants explained that Glukhovsky fails to teach or suggest several limitations of claim 68. In particular, Glukhovsky fails to teach or suggest – as the previous Office Action admitted – "storing a fabrication process dependent value for an imager chip [and] storing at least one chip dependent value representing a measured pixel dark current reference value and a reference temperature at which said chip dependent dark current reference value was measured."

The portion of Glukhovsky relied upon by the Office Action discloses a "processor capable of ... calculating the image sensor temperature 17 using the known equations derived for thermal noise. It will be appreciated that these equations are an approximation of a complex

phenomenon and that calibration should be employed in order to deduce the actual calculations that will be applied." The foregoing disclosure fails to teach or suggest the above-quoted limitations of claim 68.

The Office Action did not respond to Applicants' arguments. In the "Response to Arguments" section, the Office Action quoted Applicants' argument, then quoted the rejection language from the previous Office Action, and concluded (at p. 7) that "[t]he Office action is [sic] thus adequately interpreted the limitations of the claim." The Office Action is supposed point out where in Glukhovsky each of the claim limitations can be found, rather than "adequately interpret[ing] the limitations of the claim." The Office Action failed to respond to Applicants' arguments regarding the shortcomings of Glukhovsky.

2. On page 14 of the September 4 Amendment, Applicants explained that Sakaue fails to teach or suggest limitations of claim 68. Applicants explained that Sakaue fails to remedy the deficiencies of Glukhovsky. Sakaue teaches only that the "amount of dark current charge depends on defects of a semiconductor substrate and the manufacturing process of the device." Sakaue fails to teach or suggest "storing a fabrication process dependent value for an imager chip." Further, Sakaue fails to teach or suggest "storing at least one chip dependent value representing a measured pixel dark current reference value and a reference temperature at which said chip dependent dark current reference value was measured," or "determining a chip temperature representation based on said ... stored values."

The Office Action did not address these arguments regarding Sakaue. The Office Action responded by asserting (at p. 8) that "[i]t is well know that the dark current is typically ... a result of surface damage ... resulting from manufacturing processes such as gate and spacer etching steps," and that "dark current can result in reduced pixel sensitivity and lower dynamic range of the image sensor device." Based on the foregoing, the Office Action concluded that "the step of 'storing a process dependent value' or 'determining a chip temperature representation based on stored values' is the typical way in the art to enhance the sensitivity of the imager sensor."

Initially, Applicants traverse the new rejection based on the assertion that the aforementioned process steps are "typical" in the art. "It is never appropriate to rely solely on 'common knowledge' in the art, without evidentiary support in the record, as the principal evidence upon which a rejection was based." MPEP § 2144.03.A (legal citations omitted). If the Examiner wishes to maintain this position then supporting documentary evidence must be provided. MPEP § 2144.03.C. Moreover, the asserted "well known" steps do not correspond directly to the claim language.

In addition, Applicants note that the Office Action did not disagree that Sakaue fails to teach or suggest the above-quoted limitations of claim 68. Thus, the Office Action has not shown that all of the limitations of claim 68 are taught or suggested by Glukhovsky or Sakaue, whether taken alone or in combination, and the rejection must be withdrawn.

3. Notwithstanding the fact that neither Glukhovsky or Sakaue, whether taken alone or in combination, fail to teach or suggest all of the limitations of claim 68, Applicants explained with particularity in the September 4 Amendment that the references are not properly combinable as suggested to arrive at claimed invention. The previous Office Action asserted that since Glukhovsky discloses "calibration" and Sakaue discloses that dark current "depends" on manufacturing, it would have been obvious to combine such teachings. To the contrary, the "calibration" contemplated by Glukhovsky relates to "known equations derived for thermal noise," which are only "approximation(s)" and, thus, calibration should be employed. Column 3, lines 50-57. Sakaue's teaching that the "amount of dark current charge depends on ... manufacturing" has no relation to Glukhovsky's suggestion that calibration should be performed because "known equations for thermal noise ... [are] approximations." Thus, there would have been no reason – and neither Office Action provided any – to contemplate the combination suggested by the Office Action.

In the "Response to Arguments" section, the Office Action's responded (at p. 9) with a form paragraph, stating that "the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art ... ." This bare, unsupported assertion is

traversed as failing to comply with the requirements set forth in MPEP § 2142 for establishing a prima facie case of obviousness. The Office Action did not address Applicants' arguments, and failed to explain how or why Glukhovsky or Sakaue can be combined to teach "storing a fabrication process dependent value for an imager chip [and] storing at least one chip dependent value representing a measured pixel dark current reference value and a reference temperature at which said chip dependent dark current reference value was measured," together with the other limitations of claim 68.

The specification discloses how the inventors arrived at aspects of the claimed invention. "The inventors have observed that a CMOS imager pixel dark current doubles every N°C with N being a value which is process dependent and which in general ranges from 6 to 10." Specification, paragraph [0020]. The specification discloses, for example, that "one way to determine [process constant] α is to use the slope of a logarithmic equation describing dark current measurements at specific sensor temperatures for chips produced by the same process," and that "sensor temperature can be calculated from the stored values α ... and a pixel dark current measurement." Specification, paragraphs [0025] through [0028]. The invention is not limited to the disclosed embodiments.

For at least the foregoing reasons, claim 68 is allowable. Claim 69 depends from claim 68 and contains every limitation of claim 68. Claim 69 is allowable for the same reasons claim 68 is allowable, and also because the unique combinations recited by the dependent claim are neither taught nor suggested by the cited references, whether taken alone or in combination.

Claim 76 recites "determining a temperature value using said acquired dark current signal together with a fabrication process value, and at least one other value representing a reference dark current signal of a pixel of said pixel array taken at a reference temperature." For the reasons discussed above with respect to claim 68, claim 76 is allowable over the cited references. Claims 77-79 depend from claim 76 and are allowable for the same reasons claim 76 is allowable, and for other reasons.

Claim 86 recites "acquiring at least one dark current signal at a plurality of locations of a pixel array; and determining an associated temperature value for each of said locations using a respective said at least one dark current signal." As discussed in the September 4 Amendment, Glukhovsky fails to teach or suggest all of these limitations. Glukhovsky discloses that "it is possible to calculate the image sensor's 20 temperature based on dark current data obtained from a single pixel ... though data obtained from a higher number of pixels will achieve more accurate results." Column 4, lines 37-41. However, Gluckhovsky teaches only that the values may be integrated to calculate the temperature of the sensor (column 4, lines 50-55), and fails to teach or suggest "determining an associated temperature value for each of said locations using a respective said at least one dark current signal." Sakaue fails to add anything to Glukhovsky with respect to claim 86, and the Office Action did not contend to the contrary. The Office Action did not address the foregoing argument, and, thus, claim 86 is allowable.

Claims 80-85 and 87-92 stand rejected under 35 U.S.C. § 103 as being unpatentable over Glukhovsky and Sakaue in view of Kono, JP-402022873A ("Kono"). Reconsideration is respectfully requested.

Claims 80-85 depend from claim 76 and contain every limitation of claim 76. Claim 76 is allowable over Glukhovsky and Sakaue, as discussed above. Kono adds nothing to remedy the deficiencies of Glukhovsky and Sakaue with respect to claim 76, and the Office Action did not contend to the contrary. Claims 80-85 are allowable for at least the same reasons their base claim is allowable, and also because the dependent claims recite unique combinations that are neither taught nor suggested by the cited references. Moreover, Applicants disagree that the references are properly combinable as asserted in the Office Action.

Claims 87-92 depend from claim 86 and contain every limitation of claim 86. As discussed above, claim 86 is allowable over Glukhovsky and Sakaue. Kono adds nothing to remedy the deficiencies of Glukhovsky and Sakaue with respect to claim 86, and, thus, claims 87-92 are allowable for at least the same reason claim 86 is allowable, and for other reasons.

Claims 93, 94 and 103 stand rejected under 35 U.S.C. § 103 as being unpatentable over Glukhovsky and Sakaue in view of Wand, U.S. Patent No. 6,267,501 ("Wand"). Reconsideration is respectfully requested.

Claim 93 recites "calculating a chip temperature using the calibrated dark pixel signal and a fabrication process dependent value related to dark current and temperature, and a chip dependent value related to dark current and temperature." Claim 94 depends from claim 93. Claim 103 recites "calculating a separate chip temperature for each said dark pixel cluster using a said calibrated dark pixel signal for each said cluster and a fabrication process dependent value related to dark current and temperature, and a chip dependent value."

As Applicants discussed in the September 4 Amendment, Glukhovsky and Sakaue fail to teach or suggest the forgoing limitations of independent claims 93 and 103, as discussed above with respect to claim 68. Wand fails to remedy the deficiencies of Glukhovsky and Sakaue with respect to claim 68, and the Office Action did not contend to the contrary. Claims 93, 94 and 103 are allowable based on at least the reasons discussed above with respect to claim 68, and for other reasons. Accordingly, the rejection should be withdrawn and the claims allowed.

In view of the above, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

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